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The Kieser Training Magazine

Kieser Training …

… and with it strength for two

What could be nicer than spending time in the blissful company of one's beloved? Pity, that all too often something gets in the way – whether it's work that simply refuses to be banished from our thoughts or that tiredness that creeps up on us all too quickly. No wonder that thousands of advice columns are devoted solely to maintaining a happy relationship. It would appear that there's no simple solution – or is there?

"At long last I can give my wife that special attention."

These were the words of Dr. Gerold Manner, aged 71 responding to the question why he came to Kieser Training. Strength training for your relationship? Admittedly, at first glance that sounds somewhat bizarre. On the other hand, a relationship is sometimes a feat of strength and if you are properly equipped, you can literally give your other half that extra something.

In addition, the better you feel, the more relaxed you can be with your partner. If you feel good, strong and healthy, you can go through life with your head held high – something that was evident from the results of the study "Kieser Training works". More than half of participants, who did six months of Kieser

Dr. Gerold Manner

Training, found that they were better at coping with stress. About two thirds were more relaxed in their daily life (see Latest Research on Page 3). They were not dragged down as much by minor arguments or stress. If you are happy and satisfied with yourself as a person, then you can once again start to enjoy fully those shared moments.

Osteoporosis – A growing public health problem

Osteoporosis is a disease of the skeletal system and is one of the main causes of pain and physical disability in the modern world. With an ageing population, the number of patients developing osteoporosis is likely to double in the next 20 years.

A new report issued by the International Osteoporosis Foundation (IOF) for World Osteoporosis Day on 20 October 2010 puts the spotlight on the severe impact of spinal fractures and calls on health professionals to recognize the signs of these fractures in their patients. "The widespread under-diagnosis and lack of treatment of spinal fractures, leaves millions of people around the world with chronic pain, deformity, disability and at high risk of future fractures," says Professor John Kanis, President of the IOF.

20-25% of Caucasian women and men over 50 years have a prevalent vertebral fracture. One in five women with a vertebral fracture will sustain another one within twelve months – the fracture cascade. Although many spinal fractures cause pain and disability, they are often ignored or treated as simple back pain.

The repercussions of these common fractures can be severe, resulting in stooped back, acute and chronic back pain, loss of height, immobility, depression, increased number of bed days, reduced pulmonary function and even premature death. Globally, spinal fractures represent a huge socio-economic burden.

Causes

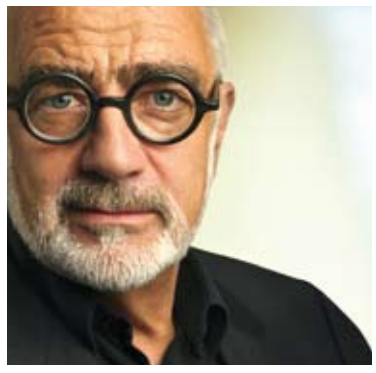
Healthy adult bone consists of living material. It has a highly structured framework (bone matrix) permeated by large amounts of calcium, organic material and numerous special cells, which continuously transform the bone matrix. Bone density is reduced if this process is not in equilibrium, i.e. if the catabolic state is dominant and the bone mass in negative balance. Osteoporosis is said to exist when the reduction in bone density reaches a critical level. It is important to remember that bone density does not stay the same throughout life. It is at its maximum at about 30 years of age. For those younger than 30, bone formation depends primarily on dietary factors and physical exercise. Men normally achieve a higher bone density because they weigh more and have more muscle mass. Inactivity or nutritional deficiencies in early life are decisive in determining whether we develop osteoporosis in later life. During our middle years, bone density is relatively stable and strongly influenced by hormonal factors. With the onset of the menopause, women experience a significant reduction in bone mass, which can be as much as 4% per year. In other words, in the 10 years following the menopause, female bone density may decline by as much as 40%. Because testosterone levels in men decline more slowly, their reduction in bone mass is much less during this phase of life.

Treatment

Effective drug therapies can reduce new vertebral fractures by 30% to 70% in postmenopausal women. Similar efficacy is observed in men. These treatments should be taken with adequate supplementation with vitamin D and calcium.

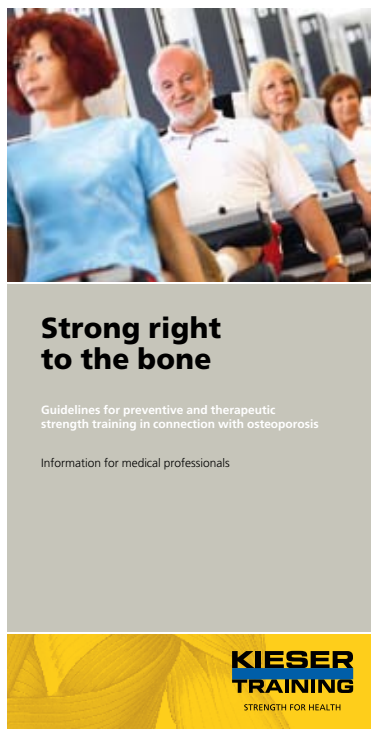
But as the case of Margaret Clark illustrates (see story on back page), strength training is being recognised more and more as a highly effective preventive and therapeutic measure against osteoporosis. On the one hand, numerous studies have shown that strengthening the muscles also strengthens the bones. On the other, a fully functional musculoskeletal system prevents falls that so often lead to a first fracture that will keep the patients bed-ridden, making them yet weaker and another fall and fracture more likely once back on their feet – setting off the vicious circle of deconditioning.

Dear Reader



Improvement in muscle strength is a key factor in the prevention and treatment of osteoporosis. To ensure that muscle training is used appropriately for both the prevention and treatment of osteoporosis, practitioners must be familiar with current thinking on diagnosis and treatment. That's why we have produced the Kieser Training Guidelines on the use of our Preventive Strength Training and Medical Strengthening Therapy for osteoporosis. They reflect current guidance and are designed to provide this knowledge in a compact format. Ask your facility to provide you with a copy for your doctor.

Werner Kieser



26 pages packed with up-to-date information on diagnosis and treatment of osteoprosis

Our brain – a master in coordination

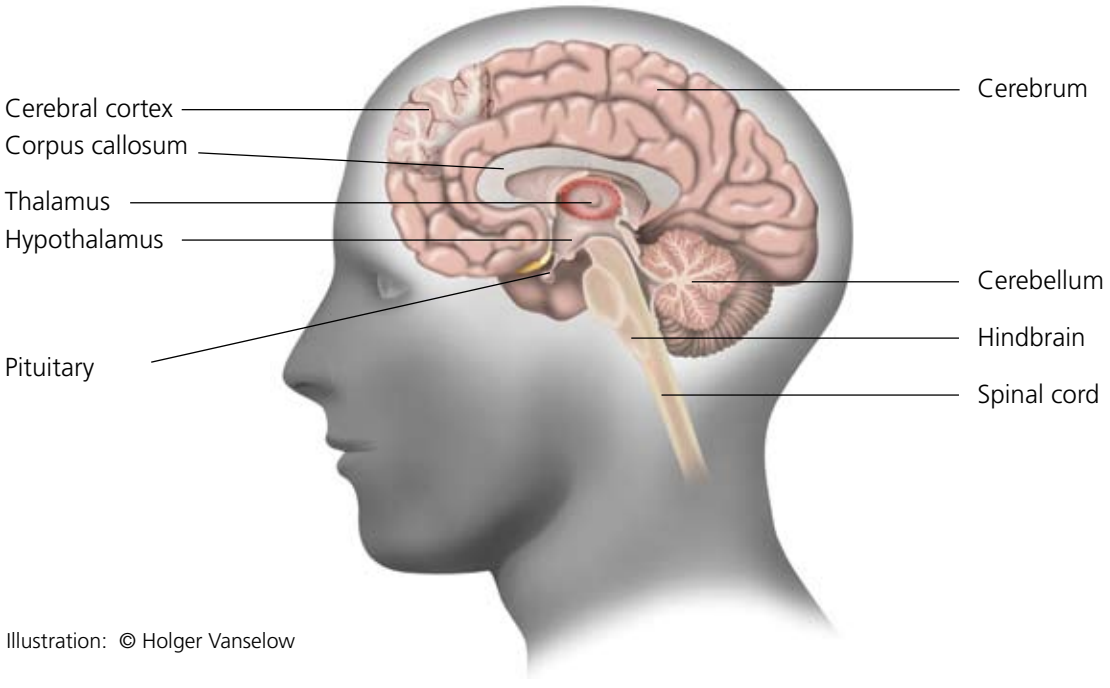


Illustration: © Holger Vanselow

The brain, which weighs some 1500 g (3 lb) is protected by three layers called meninges and equipped with blood vessels. Almost two-thirds of the brain is made up of the two hemispheres of the cerebrum, which are linked together by the corpus callosum. The left hemisphere of the brain is responsible for functions such as logical thinking and language, whereas the right hemisphere is responsible for musicality, creativity and spatial perception. Each half controls the movements on the opposite side of the body, i.e. the left half controls the right side and vice versa. The cerebrum itself is enclosed by the cerebral cortex which is 3 mm thick.

The thalamus (interbrain) is the "gateway to consciousness". It acts as a filter and decides what information is transmitted to the cerebrum and so reaches our conscious level. The hypothalamus controls the autonomic, unconscious nervous system (body temperature, blood pressure) and together with the pituitary gland (hypophysis) controls the hormone balance.

The cerebellum (little brain) controls all movements and together with the balance organ in the inner air, maintains balance. The hindbrain controls vital functions such as breathing and circulation. It is also involved in reflex-like, unconscious functions such as swallowing, coughing or sneezing.

The spinal cord is the data motorway: nerves run through it from the brain to muscles and organs and back. Together with the brain it forms the central nervous system (CNS). Emanating from the spinal cord are nerves that branch out into the body – these nerves are part of the peripheral nervous system. This system consists of the sensory nerves, which carry messages such as hot and cold from the sensory cells to the spinal cord and brain and the motor nerves, which transmit commands from the brain and spinal cords to the muscles. The autonomic nervous system is an involuntary system, i.e. cannot be influenced. It controls breathing, circulation, digestion, metabolism, glandular activity and secretions.

Why does your brain benefit when you exercise your body? Find out more below.

What is the actual effect of Kieser Training on ...

... nerve cells?

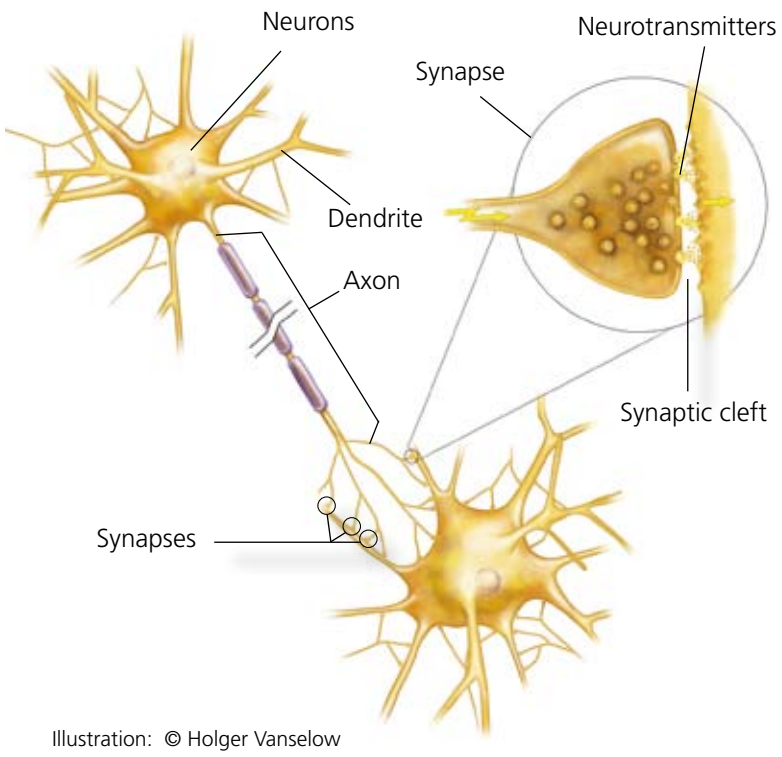


Illustration: © Holger Vanselow

The brain and spinal cord is made up of more than 100 billion nerve cells (neurons). Each neuron is made up of a body and a nerve process (axon) that can be up to 1 metre long. Axons transmit electrical signals. In addition to the axon, one neuron can have many other processes, which are known as dendrites and are responsible for communication between individual neurons.

The synapses provide the connection with other neurons, muscle fibres and glands. When a synapse receives an electrical impulse, chemical messengers (neurotransmitters) are released. These messengers pass through the synaptic cleft and so reach the target organs: muscle fibres, endocrine glands or other nerve cells. In this way, they control our hormonal balance, trigger muscle contractions and ensure active communication with other neurons: one neuron can have up to 10,000 interfaces with other neurons and in total there are about one trillion of these interfaces.

The entire system can be likened to a telephone network equipped with numerous branch lines. If the individual branch lines are used frequently and intensively, the connections become "more stable". In contrast, if they are not used, the lines are shut down.

However, is our ability to think and remember just a case of intensive brain use? It's not that simple! Although the principle of "use it or lose it" also applies to the brain, "thinking" on its own is not enough to kick start the central nervous system.

Recent brain research has shown that physical loads and exertion are the strongest stimuli in terms of the development of neurons and increasing their performance. Brain researchers have discovered that the various factors required for neuron growth are only produced in sufficient quantity if the body is subject to a minimum level of physical exertion. Firstly, it stimulates the formation of the proteins required for neuron development and secondly, it increases the production of the messengers that transmit the nerve signals. Overall, these growth factors not only produce more cells but also produce more branches, i.e. data connections between cells. The flow of information improves and we think more quickly and creatively.

This refutes the idea that brain performance declines with age and that this decline is something that cannot be influenced. With brain training, a good diet, exercise and strength training, we can stimulate the build-up and activity of neurons to an advanced age.

Doctor's Tip

What can we do about dementia?

Dementia – the term comes from Latin and means "without mind" – is a progressive loss of intellectual capacity, e.g. reasoning, memory or even personality changes. In the majority of cases, Alzheimer's disease or the vascular destruction of cerebral tissue is the result of so-called vascular dementia. Hybrid versions are frequent. Dementia is often associated with a loss of motor function and independence and so is the most likely reason why the elderly will need care.

According to WHO statistics, there are currently some 24.3 million dementia sufferers worldwide and the number of new sufferers each year is 4.6 million. A study entitled "Training for Dementia" published by experts from the Network for Ageing Research at the University of Heidelberg found that strength training improved cognitive function and significantly enhanced general quality of life. These findings support the results of research by other international groups who have published similar results in recent years, in particular in 2008 as part of a comprehensive meta analysis.

The Heidelberg researchers found that strength training improved the faculty of reasoning in people with dementia as well as their perception. It also stabilised their mental state. At the same time, it improved their motor system and physical activation and reduced the risk of falls. Strength training can, therefore bring about a significant improvement in both physical and mental performance, slow down progression of the illness and maintain independence. There is no need for sufferers simply to accept the disease as fate. By doing targeted strength training, they can actively influence its course.

Published references can be found at reflex.kieser-training.com.

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Machine of the Month – A1

When switching to a new programme, the A1 is a demanding alternative to the back machine, F3. Whereas the F3 trains the erector muscle of the spine (musculus erector spinae) in isolation, the A1 trains this muscle and the greatest gluteus muscle (m. glutaeus maximus). When doing the A1 (hip extension exercise), you feel both muscles, particularly in the final phase. In addition, the A1 also uses the thigh biceps (m. biceps femoris), the semitendinous muscle (m. semitendinosus) and the semimembranosus muscle (m. semimembranosus).

Lie on your side and then push against the weight to extend the legs as far possible to the rear. Make sure that the hip is positioned on the machine's axis of rotation. Almost no arm strength should be required in order to stop the upper body from swinging to and fro. If your body position is correct, the exercise will be effective.

Expert's Tip

The first twenty sessions at Kieser Training serve to correct strength curves and improve range of motion. During this phase, it is important that customers learn how to do each exercise in high training quality (neuro-muscular adaption = interplay of nerves and muscles). At the same time, we also provide customers with the basic theory of strength training. During the introductory phase, the focus is on single-joint exercises for agonists and antagonists in the main muscle groups. After about 20 training sessions, coordination between nerves and muscles is improved and so there is a gradual transition to the build-up phase. Your 2nd training programme will include more exercises that train individual muscle groups rather than just single muscles.

In terms of the load on muscles during the build-up phase, you should strive for local fatigue. Try to do each exercise for more than 90 seconds and increase the weight by 5% at each session. This equates to the dynamic growth potential of healthy muscles. The build-up of muscle and strength is strenuous. However, it is also rewarding as muscles tone up and strength increases.

After several weeks of rewarding work to build up muscle, progress will slow and your motivation will be put to the test. Don't be discouraged. Turn your training into a routine, i.e. train on specific days and at specific times. In this way, training soon becomes a habit. Once you have established the training habit, it will soon become easier.

When you have achieved you own aims in terms of strength build-up, it takes much less training to maintain that level and avoid future problems. Ask your instructor for a control session, and learn how to switch to maintenance training.

Frank Rothe
Research Department Kieser Training

Latest research – Strength for use in daily life

Feeling lighter is one of the main benefits of a trained body. Regular strength training significantly improves physical performance and has a positive effect on quality of life – just two of the findings from a recent study by the Kieser Training Research and Development Department.

The study involved 531 individuals who trained at Kieser Training under normal conditions for six months, training on average twice a week. The result: 87.2% noticed an increase in physical performance, which in turn had a positive effect on their daily life: More than half of participants reported higher productivity at work and four out of five felt better prepared for their particular sport.

With a well trained body, everything feels easier: this is because the muscles cope better with the stresses and strains of daily life. As earlier studies have shown, strength plays a crucial role in how we cope with many everyday activities. The results of the recent Kieser Training R&D study support this finding: strengthening the body provides strength for use in daily life.

Background: when you train, you work a muscle until it reaches its limit and so fatigues. However, if you train regularly, the muscle responds and adapts to the effort in excess of its stimulus threshold. As a result, the muscle can cope with a higher load; you achieve more and fatigue less quickly.

In addition to the effect on pure physical performance, strength training also affects the psyche – another finding of the recent study: 83.3 % of participants found that training was a good counterbalance to daily life, 58.3 % found they coped better with stress and more than one in three reported that they were sleeping better. In other words: the quality of life of participants had improved significantly – and not just because they felt lighter.

5 questions... on osteoporosis

Dr. Weiß, your latest book is called "Osteoporosis can be cured". What are the main ingredients of successful treatment?

When treating osteoporosis, you first need to ensure that the patient is getting sufficient vitamin D and calcium with vitamin D being much more important than calcium. Specific medication will only be required if the osteoporosis is advanced. However, in almost all cases, it is also essential that the patient does strength training for the systematic build-up of muscles. In medical circles, the effect of strength training is still undervalued.

Why is strength training so important?

Strength training stimulates bones and triggers the associated bone construction processes. When you use a muscle to lift a weight, a tensile, compressive and in particular bending load is transferred via the muscle origin and insertion to tissue in the bone. If the load is sufficiently intense, the body creates new bone tissue and more mineral salts are deposited. This in turn increases both bone mass and bone density. Provided that strength training is done to the right level and done regularly, patients can increase their bone density by as much as 15% in just 12 months – a sensational result and something no medication can achieve.

What is your recommendation to patients with osteoporosis?

For patients already suffering from osteoporosis, I recommend – in addition to conventional treatment – Medical Strengthening Therapy under the direction of a medical professional and accompanied on a 1:1 basis by a therapist. The use of Medical Strengthening Therapy ensures that patients train at the right intensity and at right level. When patients do muscle training, they also strengthen their bones. We know, from empirical evidence, that complication rates are very low and so the use of Medical Strengthening Therapy is very safe, even for patients with advanced or severe osteoporosis. In addition, muscle coordination is improved and this reduces the risk of falls and the associated bone fractures. In addition, general performance increases. The overall effect is that patients retain or even restore their mobility and quality of life. Of course, patients must undergo a complete medical examination before starting therapy.

Are there any particular points to watch out for doing training?

In order to avoid vertebral sintering, programme modifications are required for elderly customers and those with additional risks. Axial compression loads on the vertebral body and loads on the anterior edge through forced flexion are potentially dangerous. E1, E3, G1 and E2 are contraindicated until after the next bone density scan – usually after 1 - 2 years. B6, F2 and A2 may only be used if training quality is excellent. Assuming a target training time of 90 - 120 seconds, patients may train on all training machines to local fatigue. Instructors and therapists have a particular responsibility when dealing with customers with osteoporosis and so it is essential that entries in the main customer file are clear and unambiguous. Customers/patients must be reminded to check machine settings very carefully before starting training!

(Dr. Weiss' book, "Osteoporosis can be cured", is due to be published in English in 2011).

Column

We only regard our body as an issue when we become aware that something is not quite right – in other words if it fails to work as we would expect. However, we should not consider the human body just in terms of its functionality. Rather the body and the mind should be regarded as a single entity with each influencing the other. After all, it is not solely the mind that builds the body (Schiller) or the mind that is the sign language of the body (Nietzsche). Any approach that reduces human beings merely to their physical or their mental element lacks an essential aspect of Man's "being-in-the world". In the same way that you cannot cure a prolapsed disc purely by the laying-on of hands and words of encouragement, you cannot fully explain the ego or the perceived ego of Man by measuring electrical activity in the brain. Only if there is an indivisible interaction between the physical and the mental being, i.e. only in that "in-between" – understood as a single unit comprising the physical and the mental – can we arrive at what is meant by the term human. The body is similarly not just an essential intermediary between the ego and the world. It is part of the ego in the same way that the ego is part of the body.

Dr. Siegfried Reusch
Editor in chief of journal "der blaue reiter" – Journal for Philosophy
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www.verlag-derblauereiter.de

"Rigorous and highly scientific approach"

Professor Schmidtbleicher in conversation with Werner Kieser
Photo: © Kieser Training/Michael Ingenweyen

Professor Schmidtbleicher, you were a member of the independent group of experts accompanying the "Kieser Training works" study, which had 531 participants from 118 different facilities. What in your view was unusual about this study?
The study was a so-called multi-centre study. That means that it was conducted in various centres, in this case different Kieser Training facilities. In the research world, multi-centre studies are generally regarded as having greater validity than single-centre studies because they allow the involvement of several researchers. In addition, the number of participants at 531 is relatively high.

Can you really compare results obtained from several locations?
In this study, the results were extremely comparable: after all, all training facilities use the same range of machines and the same training concept. In addition, all instructors are well trained and to a comparable standard. This means that the study was particularly good in terms of its consistency i.e. comparability – particularly when compared with other multi-centre studies.

However, the study was conducted by the Research Department of Kieser Training AG. Can we actually trust the results of a study obtained – to a certain extent – in-house?
The study appointed a group of experts consisting of five independent scientists, of which I was one. Although Kieser Training was responsible for the design of the study, its implementation and its evaluation, the group provided the critical monitoring. As a scientific group, we were unanimous that the study adopted a rigorous and highly scientific approach and so produced credible results. To a certain extent, we guaranteed the objectivity of the results.

Could the study not have been done directly by an independent body, e.g. a university?
Economic factors would have made that difficult. To complete a study of that magnitude and duration would - even on a conservative estimate – have easily cost from 150,000 to 200,000 Euros. Similarly, the high number of participants and the high degree of comparability between individual locations would have been very difficult for an independent research institute to replicate.

For details of the study see Page 3 under "Latest Research" and
www.kieser-training.com/quality/study/

Profile:

Prof. Dr. Dr. h.c. Dietmar Schmidtbleicher was awarded his doctorate for his thesis on "Maximalkraft und Bewegungsschnelligkeit" [Maximum strength and speed of movement] and qualified as a university lecturer in 1986 at the Faculty of Philosophy at the University of Freiburg, Germany. Since 1987, he has been a professor at the Institute for Sport and Sports Science at the Johann Wolfgang Goethe University in Frankfurt and since 1991 has held the Chair for Training and Exercise Sciences.

Margaret Clark gets results in battling osteoporosis

Numerous studies show how effective properly applied strength training is against osteoporosis. The case of Margaret Clark from Melbourne is a perfect illustration of how a life fraught with pain and anxiety can be turned around.

Margaret Clark undergoing treatment in the Lumbar Extension machine

When Margaret Clark had her first bone scan in early 2008, the diagnosis was clear: Her doctor told her she had osteoporosis and prescribed a drug that would take care of the problem. But the then 57-year-old felt that there must be a better answer to her problem.

She researched on the internet and came across the BEST study (http://www.citracal.com/best/) which showed that a combination of medication and strength training significantly improved the outcome. She joined a local women's gym, but strength training was not exactly the core of their competence. Disappointingly, another scan one year after the first showed bone mass density (BMD) in her lumbar spine had decreased further.

"I was developing back pain and it was beginning to restrict my activities. So the news that my BMD was getting worse was quite scary," Margaret Clark explains.

By chance, her daughter Julia had recently started therapy for a hip problem at Kieser Training in London, where she lived at the time. Happy with the results and loving the Kieser Training concept, she urged her mother at home to start Kieser Training at the new South Melbourne facility.

As so often, desperation was a good motivator. "I went in and was seen by physiotherapist Paul Percy who recommended I start with 12 sessions of Medical Strengthening Therapy. The pain initially got worse, but after a few sessions things started to improve." As her deep-seated lumbar spine muscles got stronger when trained in isolation on the Lumbar Extension machine, the pain receded and functionality was gradually restored.

In April 2010, a year after starting Kieser Training, Margaret Clark had another scan. The BMD in her lumbar spine had not only stopped worsening, it showed a dramatic 5% improvement.

"More importantly, my lower back pain has all but disappeared. I no longer need to see my osteopath or physiotherapist and I've become a work horse in my garden, mowing the lawn and clearing weeds with no ill effects the next day."

One result of her strength gains is, that confidence in her lower back is even greater now than before she developed back pain.

Now, her motivation is to see if she can increase her BMD even more. Her next scan is due in the middle of next year and she has decided to do another 30 therapy sessions to optimise the effect on her lumbar spine. With her supplementary training programme, she ensures that the rest of her musculoskeletal system stays in good shape, too.

With daughter Julia now back in Australia, they can now train together, which makes the regular trip to Kieser Training a little easier. True to the Australian competitive spirit, the mother points out that her weights were much higher than her daughter's... although she has now caught up!

Margaret Clark likes open nature of the Kieser Training centre and its no-nonsense approach to training: "Come in, do what you need to do and go. I do loath some of the machines, but it's not about enjoyment, it's about getting a result and maintaining that result." In her mind she will be doing Kieser Training for the rest of her life.